

SOLID-STATE RADIATION DETECTOR USING A SINGLE  
CRYSTAL OF COMPOUND SEMICONDUCTOR InSb

ABSTRACT OF THE DISCLOSURE

A high-purity InSb single crystal not artificially  
5 doped with impurities is used as a radiation detecting  
medium. In order to obtain diode characteristics, a Au-Pd  
alloy is used to form a surface barrier layer. At 4.2 K,  
the device resistance of the thus fabricated solid-state  
radiation detector was as large as  $1.4 \text{ k}\Omega$  and the rise time  
10 of output signals from a charge-sensitive preamplifier was  
as short as  $0.4 \mu\text{s}$ , indicating reduced trapping of  
electrons or positive holes. The detector was also capable  
of measuring  $\alpha$ -ray spectra over the temperature range from  
2 K to 50 K.